

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An encoded moving picture data conversion device for converting encoded moving picture data compression-encoded by using inter-frame prediction, and for outputting converted data as encoded output data capable of being subjected to special reproducing, the device comprising:

~~first storage means for storing said inputted encoded moving picture data;~~

decoding means for decoding said inputted encoded moving picture data to decoded data;

re-encoding means for re-encoding said decoded data of a picture frame in a moving picture sequence, in an intra-frame encoding mode in order to generate intra-frame re-encoded data;

~~second~~ first storage means for storing re-encoded data, said re-encoded data including said intra-frame re-encoded data;

second storage means for storing said inputted encoded moving picture data; and

selection means for making a selection of data for each picture frame, frame-by-frame, the data being selected from said ~~re-encoded~~~~encoded~~ moving picture data stored in said first storage means and said ~~re-encoded~~encoded data stored in said second storage means, and for outputting the selected data as said encoded output data capable of being subjected to said special reproducing, wherein said selection means switches its selection from data in said ~~first~~ second storage means to data in said ~~second~~ first storage means ~~when the picture quality~~

~~degradation of re-encoded data from said data in said second storage means is less than a predetermined threshold~~ at least at one frame which is closest to a frame which is at a timing when a special reproduction is required among the frames which are intra-frame re-encoded, and wherein the number of wholly intra-frame re-encoded frames included in the data selected from said re-encoded moving picture data is one.

2. (original): The encoded moving picture data conversion device according to claim 1,

wherein said re-encoding means comprises:

means for re-encoding said decoded data of picture frames as many as J following after the picture frame re-encoded in the intra-frame encoding mode, by using inter-frame prediction in order to generate inter-frame re-encoded data, where J is an integer greater than zero;

means for measuring a picture quality of re-encoded picture frames, said re-encoded picture frames including the intra-frame re-encoded picture frame and one or more inter-frame re-encoded picture frames; and

means for controlling a value of said J in accordance with said picture quality, and

wherein said selection means comprises means for, if selecting said intra-frame re-encoded data, also selecting said inter-frame re-encoded data of the picture frames as many as J following after said intra-frame re-encoded data.

3. (original): The encoded moving picture data conversion device according to claim 1,

wherein said re-encoding means comprises:

means for skipping picture frames as many as (K-1) after the intra-frame re-encoded picture frame, where K is an integer greater than one;

means for re-encoding said decoded data of a picture frame after K frames from said intra-frame re-encoded picture frame, by using inter-frame prediction with reference to said intra-frame re-encoded picture frame in order to generate inter-frame re-encoded data;

means for calculating the number of frames constituted of said input encoded moving picture data corresponding to said intra-frame re-encoded data in code amount; and

means for controlling a value of said K in accordance with the number of frames calculated, and

wherein said selection means comprises means for, if selecting said intra-frame re-encoded data, skipping the frames as many as (K-1) following after said intra-frame re-encoded picture frame, and for selecting said inter-frame re-encoded data after the K frames from said intra-frame re-encoded picture frame.

4. (original): The encoded moving picture data conversion device according to claim 1,

wherein said re-encoding means comprises means for re-encoding said decoded data of frames at L-frame intervals in an intra-frame encoding mode to generate intra-frame re-encoded data, in such a way that re-encoded data in each frame occupy at least a part of the frame and re-encoded data gathered from frames as many as M cover an entire frame area, where L is an integer greater than one and M is an integer greater than one, and

wherein said selection means comprises means for selecting only said intra-frame re-encoded data in response to a high-speed reproducing request, and for outputting said selected re-encoded data as said encoded data capable of being subjected to said special reproducing.

5. (currently amended): An encoded moving picture data conversion method for converting encoded moving picture data compression-encoded by using inter-frame prediction, and for outputting converted data as encoded output data capable of being subjected to special reproducing, the method comprising:

~~a first storage step of storing said inputted encoded moving picture data;~~
~~a decoding step of decoding said inputted encoded moving picture data to decoded data;~~
~~a re-encoding step of re-encoding said decoded data of a picture frame in a moving picture sequence, in an intra-frame encoding mode in order to generate intra-frame re-encoded data;~~

a first second storage step of comprising storing re-encoded data, said re-encoded data including said intra-frame re-encoded data;

a second storage step comprising storing said inputted encoded moving picture data; and
~~a selection step of making a selection of data for each picture frame, frame-by-frame, the data being selected from said re-encoded encoded moving picture data stored in said first storage storing step, and said encoded re-encoded data stored in said second storage storing step, and for outputting the selected data as said encoded output data capable of being subjected to said special reproducing,~~

wherein said selection step includes switching selection from data stored in said first second storage storing step means to data stored in said ~~second first storage means storing step~~

~~when the picture quality degradation of re-encoded data from said data in said second storage means is less than a predetermined threshold at least at one frame which is closest to a frame which is at a timing when a special reproduction is required among the frames which are intra-frame re-encoded, and~~

~~wherein the number of wholly intra-frame-encoded frames included in the data selected from said re-encoded moving picture data is one.~~

6. (currently amended): The encoded moving picture data conversion method according to claim 5,

wherein said re-encoding step comprises:

a step of re-encoding said decoded data of picture frames as many as J following after the picture frame re-encoded in the intra-frame encoding mode, by using inter-frame prediction in order to generate inter-frame re-encoded data, where J is an integer greater than zero;

a step of measuring a picture quality of re-encoded picture frames, said re-encoded picture frames including the intra-frame re-encoded picture frame and one or more inter-frame re-encoded picture frames; and

a step of controlling a value of said J in accordance with said picture quality, and

wherein said selection step comprises a step of, if selecting said intra-frame re-encoded data, also selecting said inter-frame re-encoded data of the picture frames as many as J following after said intra-frame re-encoded data.

7. (currently amended): The encoded moving picture data conversion method according to claim 5,

wherein said re-encoding ~~step~~ comprises:

~~a step of~~ skipping picture frames as many as (K-1) after the intra-frame re-encoded picture frame, where K is an integer greater than one;

~~a step of~~ re-encoding said decoded data of a picture frame after K frames from said intra-frame re-encoded picture frame, by using inter-frame prediction with reference to said intra-frame re-encoded picture frame in order to generate inter-frame re-encoded data;

~~a step of~~ calculating the number of frames constituted of said input encoded moving picture data corresponding to said intra-frame re-encoded data in code amount; and

~~a step of~~ for controlling a value of said K in accordance with the number of frames calculated, and

wherein said selection ~~step~~ comprises ~~a step of~~, if selecting said intra-frame re-encoded data, skipping the frames as many as (K-1) following after said intra-frame re-encoded picture frame, and ~~for~~ selecting said inter-frame re-encoded data after the K frames from said intra-frame re-encoded picture frame.

8. (currently amended): The encoded moving picture data conversion method according to claim 5,

wherein said re-encoding ~~step~~ comprises ~~a step for~~ re-encoding said decoded data of frames at L-frame intervals in an intra-frame encoding mode to generate intra-frame re-encoded data, in such a way that re-encoded data in each frame occupy at least a part of the frame and re-encoded data gathered from frames as many as M cover an entire frame area, where L is an integer greater than one and M is an integer greater than one, and

wherein said selection ~~step~~ comprises ~~a step of~~ selecting only said intra-frame re-encoded data in response to a high-speed reproducing request, and ~~for~~ outputting said selected re-encoded data as said encoded data capable of being subjected to said special reproducing.

9. (currently amended): An encoded moving picture data conversion apparatus for converting encoded moving picture data ~~compressed~~ compression-encoded by using inter-frame prediction to converted data, the apparatus comprising:

decoding means for decoding said inputted encoded moving picture data to obtain decoded data;

re-encoding means for re-encoding said decoded data ~~in~~ at an intra-frame encoding mode in order to generate intra-frame re-encoded data;

replacing means for replacing a portion of said inputted encoded moving picture data by said re-encoded data, for outputting the replaced data as said converted data at least ~~when the picture degradation of said re-encoded data from said portion is larger than a predetermined threshold~~ at one frame which is closest to a frame which is at a timing when a special reproduction is required among the frames which are intra-frame re-encoded, and

wherein the number of wholly intra-frame re-encoded frames included in the data selected from said re-encoded moving picture data is one.

10. (currently amended): An encoded moving picture data conversion method for converting encoded moving picture data ~~compressed~~ compression-encoded by using inter-frame prediction to converted data, the method comprising:

~~a decoding step of decoding said inputted encoded moving picture data to obtain decoded data;~~

~~a re-encoding step of re-encoding said decoded data at~~ in an intra-frame encoding mode
in order to generate intra-frame re-encoded data;

~~a replacing step of replacing a portion of said inputted encoded moving picture data by said re-encoded data, for outputting the replaced data as said converted data at least when the picture degradation of said re-encoded data from said portion is larger than a predetermined threshold~~ at one frame which is closest to a frame which is at a timing when a special reproduction is required among the frames which are intra-frame re-encoded, and

wherein the number of wholly intra-frame re-encoded frames included in the data selected from said re-encoded moving picture data is one.